

USU Medicine

Uniformed Services University of the Health Sciences

Fall 2002



Radioprotectants
Emerging Infectious Diseases
Neurotrauma
Vaccine Research
Daylight Savings



Mission-based research and its far-reaching impact

USU researchers investigate specific, and often uncommon, diseases that threaten the health of members of the uniformed services and their families during times of peace as well as deployment. This research is at the core of the university's mission, and our basic and clinical scientists continue to make great strides, as we report on the pages that follow.

Using satellite imaging and remote sensing devices, USU researchers have helped predict high-risk locations for the occurrence of malaria and similar diseases that are endemic in many areas where the military deploys its forces. Our scientists and alumni are currently studying the causative agents and pathogenesis of infections, including West Nile virus, Venezuelan equine encephalitis, gonorrhea, and intestinal diseases such as shigellosis and salmonellosis, among others. We have identified previously unknown bacterial virulence genes and analyzed the origins and pathology of various virus types. In turn, we have advanced understanding of how diseases are transmitted and their internal mechanisms, so that we may better control their spread and pernicious effects. This is critically important now that a number of them constitute natural biological threats or potential biowarfare weapons.

Bringing us even closer to the battlefield, great strides have been made by our researchers in the care of war fighters. Improvements in eye care to ensure troops are combat-ready, the development of drugs with the potential to keep soldiers safe from exposure to high levels of radiation, and treatment for traumatic brain or spinal cord injuries suffered in the field are all endeavors covered by the USU umbrella.

Our discoveries and their translation to prevention and treatment benefit the military forces and, ultimately, the health and well being of all Americans, as well as people around the globe.

USU faculty, graduates and staff continue to take leading roles in research, medicine, homeland security and defense. This issue highlights their ongoing involvement in local and national agencies and institutions here and abroad. We hope you will enjoy reading about them as much as we take pride in their commitment and accomplishments.

James A. Zimble, M.D.

USU Medicine

The magazine of the Uniformed Services University of the Health Sciences

James A. Zimble, M.D.
President

Larry W. Laughlin, M.D., Ph.D.
Dean, F. Edward Hébert School of Medicine

Patricia A. Hinton Walker, Ph.D., R.N.
Dean, Graduate School of Nursing

Cinda J. Helke, Ph.D.
Associate Dean, Graduate Education

Executive Editor
Sharon Willis

Editor
Helaine Ahern

Contributors
Tech. Sgt. Ann Bennett, Justine Cowan,
JO2 Robert Keilman, Akiko Lattin,
Lisa Reilly, Michelle Stepney

Design
Ellena Vasquez

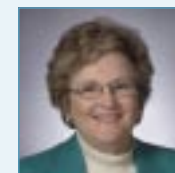
Established by Congress in 1972 and operated by the Department of Defense, the Uniformed Services University of the Health Sciences (USU) is the nation's federal medical school and graduate school of nursing. Its mission includes teaching, training and research. USU graduates serve worldwide.

USU Medicine is published twice a year. It is a magazine for alumni and associates of USU. The contents do not necessarily reflect the official views of, or endorsement by, the Department of Defense or the university.

Please send comments to:
Helaine Ahern
Assistant Vice President for Development
Uniformed Services University
4301 Jones Bridge Road, Rm. A1050
Bethesda, MD 20814-4799
hahern@usuhs.mil

*Produced by the
Henry M. Jackson Foundation
for the Advancement of Military Medicine*

Contents



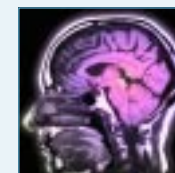
- 2 Frontline**
New leadership comes to campus, including new Dean for the Graduate School of Nursing.



- 9 Radioprotectants**
Latest advances to keep military personnel safe from radiation exposure.



- 12 Emerging Infectious Diseases**
USU researchers study a broad array of diseases that threaten troops and civilians worldwide.



- 14 Neurotrauma**
Two research programs help prevent and treat brain and spinal cord injuries.



- 18 Institute for Vaccine Research**
Scientists at USU work to advance vaccine technology to prevent disease.



- 20 Daylight Savings**
A discovery by scientists in USU's Department of Anatomy, Physiology and Genetics may eventually result in a treatment for jet lag and help optimize performance by deployed service members.



- 22 Findings**
Department of Medicine participates in nationwide study on implantable cardioverter defibrillators.



- 24 From the Field**
Unique challenges are faced while caring for detainees at Camp X-Ray.

School of Medicine Dean Retires After 22 Years

During the second retirement ceremony of his USU career, Dr. Val Hemming bid farewell to the office of dean of the School of Medicine on May 18. Hemming first retired from the Air Force in 1990, while serving as the chair of the school's pediatrics department. After being named interim dean of the medical school, he was appointed dean by USU's Board of Regents in May 1996.

Hemming's academic and research interests have included pathogenesis of Lancefield group B streptococcal infections in the neonate; viral infections in infants and young children; and pediatric education for undergraduate medical students. Most significant is his research in Respiratory Syncytial Virus infection. In the

May 17, 2002, *Congressional Record*, Maryland Senator Paul Sarbanes lauded Hemming's scientific achievements in this area:

"His research in the Respiratory Syncytial Virus, RSV, infection resulted in the first biological product for the prevention and reduction of RSV infection in children. His product, which was approved by the Food and Drug Administration in January of 1996, has contributed to the fight against an infection that had claimed the lives of 4,500 children and hospitalized more than 90,000 children in our nation each year."

Hemming was honored with dean emeritus status as well as professor emeritus in the USU pediatrics department. He remains actively



engaged in research pursuits, which include developing an improved small animal model of human tuberculosis with Dr. Shelley Trucksis of the University of Massachusetts and studies with Virion Systems on the role of viral pulmonary infections in very young children who develop asthma. •

Founding Dean of Graduate School of Nursing Retires

After 49 years of service to the federal government and the nation, Dr. Faye Glenn Abdellah retired from USU's Graduate School of Nursing in May, where she had served as founding dean for the past nine years.

Dean Abdellah has been a nurse, educator and researcher with international recognition. She was the first nurse to hold the rank of rear admiral, upper half, and the title of Deputy Surgeon General of the U.S., when she served under Dr. C. Everett Koop. Her achievements include developing the first tested coronary care unit, which saved thousands of lives, authoring more than 152 publications, and receiving nearly 90 professional and academic honors and 11 honorary degrees.

She was recently inducted into the National Women's Hall of Fame.

Her leadership of the school, where unique advanced practice nurses are prepared to deliver care to men and women in uniform during disasters and humanitarian interventions, has contributed greatly to military medicine and readiness. In recognition of that, the Abdellah Nursing Research Fund was established to lead to an endowment that will support innovative research in this field. More than \$25,000 has been raised in her honor to date.

For more information about the Abdellah Nursing Research Fund, please contact the USU Development Office at (301) 295-3094 or at hahern@usuhs.mil. •



Dean Abdellah poses with the bust of Clara Barton, an original sculpture contributed to USU by retired Air Force Brig.Gen. V.M. Rexroad.

President Bush Names USU Faculty Member Surgeon General

Ten years ago, Dr. Richard Henry Carmona rescued a person stranded on a cliff by lowering himself from a helicopter, inspiring a television movie. His experiences as a SWAT team member with the Pima County Sheriff's Department in Arizona earned him recognition as one of the nation's "10 Top Cops."

In fact, his knowledge of medicine, law enforcement, hazardous materials, emergency medical response and bioterrorism, as well as his background in the Army special forces, provide Carmona with a unique perspective on his responsibilities as the nation's latest "Top Doc" – the Surgeon General of the United States.

"At a time when our country faces a new public health threat from bioterrorism, we need a surgeon general who understands this threat and can provide strong leadership to the nation. Dr. Carmona will provide such leadership. Dr. Carmona is a hero to those he serves in Arizona and we expect he will be a hero to the cause of stronger public health in America as surgeon general," Health and Human Services Secretary Tommy Thompson said.

His experience in managing major public health organizations and in emergency preparedness, along with his commitment to prevention as an effective means to improve public health, were cited by the White House as the strengths Carmona would bring to this important national role.

According to President Bush, key issues Carmona will focus on during his tenure as surgeon general include ensuring preparedness for public health emergencies and bioterrorism; leading a new initiative focusing on prevention and fitness as keys to reducing disease and improving medical care; and speaking out on the health dangers of alcohol and drug abuse.

Carmona comes to the post with a diverse and highly qualified background. A trauma surgeon and former deputy sheriff, Carmona enlisted in the Army at age 17 and had a successful career with the special forces, getting his high school equivalency degree along the way. He served in the Vietnam War, earning two Purple Hearts and a Bronze Star. He went on to receive a bachelor's degree in 1976 and his Doctor of Medicine degree in 1979,



White House photo by Tina Heger

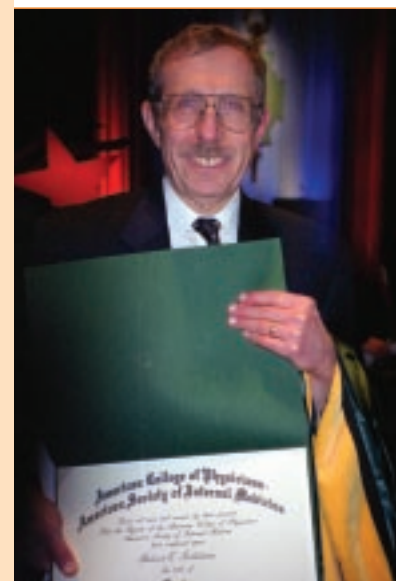
both from the University of California, San Francisco. After completing his residency and fellowship in San Francisco, he moved to Arizona in 1985, where he started the region's first trauma care program and was director of trauma services at Tucson Medical Center. He also held faculty appointments as a clinical professor of surgery, public health and family medicine at the University of Arizona.

Carmona, currently an assistant professor of military and emergency medicine, has been on the USU faculty since 1993 and has been actively involved with the university's Casualty Care Research Center. •

Goldstein Earns Lifetime Distinction

Robert Goldstein, M.D., chair, Department of Medicine, was named a Master of the American College of Physicians-American Society of Internal Medicine. He was one of 34 internists nationwide honored in this fashion during the ACP-ASIM annual convocation in Philadelphia this past spring. This is a lifetime achievement distinction, based on many years of service to internal medicine. The award permanently entitles the awardee to use the initials "MACP" as part of his or her professional signature.

Goldstein was nominated for this award by the metropolitan Washington, D.C., chapter of the society. In addition to Goldstein, two current USU medicine department faculty members were also among the 34 internists honored. Kurt Kroenke, M.D., adjunct professor of medicine, and Michael Kussman, M.D., adjunct associate professor of medicine, were both named Masters in the ACP-ASIM. Retired military medical history department Chair Robert J.T. Joy, M.D., delivered a special address at the meeting. •



Twenty-third Commencement Exercise Held on Armed Forces Day

With flourish and grandeur, USU honored its graduating students during its twenty-third annual commencement exercise.

More than 3,000 graduates, faculty, staff and guests gathered together for the ceremony in the National Society Daughters of the American Revolution Constitution Hall in Washington, D.C., on May 18, coinciding with Armed Forces Day.



The university's F. Edward Hébert School of Medicine conferred Doctor of Medicine degrees upon the 163 U.S. Army, Navy and Air Force graduates of the class of 2002.

Among the graduates were several who received academic or professional awards. They included: Lt. Christina Zavari, USN, Board of Regents Award for outstanding medical officer candidate; Lt. Jennifer Driscoll, USN, Society of Medical Consultants to the Armed Forces Award; Lt. Rupa Dainer, USN, Association of Military Surgeons of the United States Award; Capt. Ramey Wilson,

U.S. Army Surgeon General's Award; Lt. David Brett-Major, U.S. Navy Surgeon General's Award and Esprit de Corps Award; and Capt. Gilberto Patiño, U.S. Air Force Surgeon General's Award.

The School of Medicine also bestowed 15 doctoral and 34 master's degrees from the various biomedical sciences graduate programs. More than 714 students have received their advanced degrees here in the past 25 years.

Sara Newman, who gave the graduate student farewell address, was also the recipient of the USU Graduate Student Award and the Henry M. Jackson Foundation Fellowship in Medical Sciences.

The Graduate School of Nursing awarded 13 Master of Science in Nursing degrees to 12 family nurse practitioner students and one nurse anesthesia student during the ceremony. Twelve other students in the school's nurse anesthesia program were recognized but will receive their degrees in December, after completing their course requirements.

Since the GSN was created in 1993, 170 family nurse practitioners and nurse anesthetists have received their Master of Science in Nursing degrees from the school.

Family nurse practitioner graduates receiving awards were Lt. Cmdr. Dominic Weskamp, USPHS, Outstanding Student Award, USPHS

Chief Nurse Award, Directors Award for USPHS and Dean's Award for Research Excellence; Capt. Curtis Aberle, USA, Esprit de Corps Award; Capt. Denise Lyons, USA, Distinguished Academic Performance Award; Capt. Angelo Moore, USA, Distinguished Clinical Performance Award; and Maj. Richard Prior, USA, Dean's Award for Research Excellence.

Award winners for the nurse anesthesia program were Capt. Mary Jo Burleigh, USAF, Outstanding Student Award; Capt. Annie Hall, USAF, Dean's Award for Research Excellence; and Capt. Ronald Wyatt, USAF, Esprit de Corps Award.

Eugene Levine, Ph.D., received the Faye G. Abdellah Faculty Research Award, which was presented for the first time this year. The award is named for the school's founding Dean Faye G. Abdellah, who retired in May.

U.S. Public Health Service Capt. Scott R. Lillibridge, a 1981 graduate of USU and special assistant to the Secretary of Health and Human Services for bioterrorism, was this year's commencement speaker.

Lillibridge, along with Dale C. Smith, Ph.D, professor and chairman of the university's Department of Medical History; and Chester J. Pletzke, former director of USU's Learning Resource Center were this year's University Medal recipients. •



Retiring Dean Val Hemming presents a flak jacket to his successor Dr. Larry Laughlin.

Chair Receives Distinguished Service Award



The ACOG Distinguished Service Award was presented to USU Department of Obstetrics and Gynecology Chair William H.J. Haffner, M.D., at the Presidential Inauguration and Convocation of the 50th Annual Clinical Meeting of the American College of Obstetricians and Gynecologists. The event was held at the Los Angeles Convention Center on May 8.

Haffner, a retired career Public Health Service medical officer, was chair of the Department of Obstetrics and Gynecology at USU for almost nine years before retiring on Aug. 1, 2001. He was reappointed to continue as civilian professor and chair. He maintains his clinical practice at the National Naval Medical Center in Bethesda.

Haffner graduated from The George Washington University School of Medicine in Washington, D.C., and completed his residency training in obstetrics and gynecology at the Columbia-Presbyterian Medical Center in New York.

He began his Public Health Service career with the Indian Health Service in 1971 when he served in OB/GYN leadership roles in Gallup, N.M. He served as OB/GYN consultant for IHS until 1994. Haffner then was transferred to the National Capital Area of IHS and served in a variety of consultative roles, including chief medical officer of the Public Health Service for four years.

Haffner received the ACOG/Wyeth-Ayerst President's Community Service Award in 1994. He is active in the Armed Forces District of ACOG and has served, or is currently serving, on several ACOG committees, including the Committee on American Indian Affairs, the Committee on Practice Bulletins-Gynecology, and the Committee on Health Care for Underserved Women. He is also the secretary-treasurer-elect of the Association of Professors of Gynecology and Obstetrics. •

CPDR Celebrates a Decade of Excellence



USU's Center for Prostate Disease Research will be celebrating its 10th anniversary this year.

The center will be holding a daylong conference in the university's Sanford Auditorium on Nov. 22. Lectures will be delivered by a number of prominent cancer researchers and clinicians, and Dr. Andrew von Eschenbach, the director of the National Cancer Institute, will present the keynote address which is being named in honor of Army Col. David McLeod. McLeod is the senior advisor and director of clinical research studies in the clinical care center of the CPDR located at Walter Reed Army Medical Center and has been integrally involved in the CPDR's efforts since its inception. •

Study Guide Authored by USU Faculty

The American Academy of Family Physicians recently published their AAFP Monograph 274, "Family Violence." The 65-page home study self-assessment is authored entirely by military health care professionals, including USU faculty members Simon Auster, M.D., J.D., Lt. Col. Deborah Bostock, USAF, Col. R. Dana Bradshaw, USAF, Lt. Col. Mark Chapin, USA, and Cynthia Williams, D.O. •

Board of Regents Adds Four New Members

Four new members of the USU Board of Regents were confirmed by the U.S. Senate in August.

Joining existing board members are Vinicio Madrigal, M.D., L.D. Britt, M.D., retired Air Force Brig. Gen. Linda Stierle, and William De La Peña, M.D.

Madrigal practices general and family medicine, and is the director of the Madrigal Family Medicine Center in Kenner, La.

Britt, a trauma surgeon, is a member of the faculty at the Eastern Virginia Medical Center in Norfolk.

Stierle currently serves as the chief executive officer for the American Nurses Association in Washington, D.C.

De La Peña is the medical director for the De La Peña Eye Clinic group in southern California and director of the ophthalmology department of Santa Marta Hospital in Los Angeles. •

New Dean for Graduate School of Nursing



Patricia A. Hinton Walker, R.N., M.S.N., Ph.D., F.A.A.N., is the new dean of USU's Graduate School of Nursing. Walker took over June 1 following the retirement of founding Dean and Professor Faye Abdellah.

Walker has served as the dean of the Mississippi College of Nursing and dean of the School of Nursing at the University of Colorado Health Sciences Center in Denver. She was the senior scholar in residence at the Agency for Healthcare Research and Quality in Washington, D.C., prior to her selection as dean at USU.

In addition to a more than 30-year teaching career, Walker has authored five books on nursing education and practice as well as 49 peer-reviewed professional articles.

Walker has a Bachelor of Science in Nursing degree from the University of Kansas. She received both her Master of Science in Nursing and her doctoral degrees from the University of Mississippi. She has been recognized by the most prestigious organizations in the nursing profession. •

Faculty Notes

Mark C.P. Haigney, M.D., was promoted to associate professor in the Department of Medicine in March.

J. Brian McCarthy, Ph.D., joined the pharmacology department faculty in June. The new assistant professor received a Bachelor of Science degree from Juniata College in Huntingdon, Pa., in 1983, a Master of Science degree from the University of Maryland, Baltimore County in 1990, and a Ph.D. from the State University of New York at Stony Brook in 1996. McCarthy completed postdoctoral training in the Department of Cellular and Molecular Physiology at Yale University School of Medicine, and was an instructor in neuroscience at the Weill Medical College of Cornell University prior to his arrival at USU. He has worked in academic research for 19 years, and has published in a number of peer-reviewed journals. McCarthy's research program investigates the regulation of synaptic receptor targeting and the mechanism of estrogen-related structural plasticity in the brain. His research is supported in part by an award from the National Institute of Mental Health.

Lt. Col. Paul Austin was recently named chair of the Department of Nurse Anesthesia in the Graduate School of Nursing. Prior to coming to USU, he was a staff instructor, clinical site director, assistant program director, and program director of the Air Force graduate program in anesthesia nursing.

Air Force Capt. Lesa Tilley joined the Department of Nurse Anesthesia last fall. Tilley is an alumna of the Texas Wesleyan University graduate program in nurse anesthesia and came to USU from Wilford Hall Medical Center. She is the director for the Basic and Advanced Principles



Mark Haigney, M.D.

of Anesthesia course and directs testing of phase II students. An expert in regional anesthesia, Tilley presented at the nationally recognized American Association of Anesthetists Spinal and Epidural Workshop in January.

Terez Shea-Donohue, Ph.D., a research professor in the Department of Medicine, was named to a four-year term as a member of the General Medicine A (2) study section for the NIH Center for Scientific Review. The group reviews and recommends grant applications and surveys the status of research and other functions that, according to NIH, "...are of great value to medical and allied research in this country."

USU adjunct faculty members Lt. Cmdr. Ronald Miller and Cmdr. Jeffrey Cole, both assigned to the medicine department at the Naval Medical Center, Portsmouth, Va., were recently named the hospital's Outstanding Teacher of the Year for Internal Medicine.

Their colleagues, also both adjunct faculty members in the medicine department, Cmdr. (select) Lisa Inouye and Lt. Cmdr. Mary Bavaro, received the James Leonard Award for outstanding teaching of USU third year students at the medical center. •



Lt. Col. Paul Austin

New Commandant of Students Selected



Former Department of Military and Emergency Medicine faculty member, Lt.

Col. Linda Lawrence, USAF, MC, was selected as the new commandant of students for the F. Edward Hébert School of Medicine, succeeding class of 1994 alumnus, Lt. Cmdr. Jay Erickson, in the post.

Lawrence was chosen from a slate of 10 candidates representing the Army, Navy and Air Force, each nominated by their respective service surgeon general. The field was narrowed to three before Lawrence's final selection to the position.

"We were fortunate to have three strong candidates for the position of commandant, School of Medicine. However, one candidate, Lt. Col. Linda Lawrence, stood above the others by having a unique combination of highly developed skills in academic medicine and experience in field operational medicine," said medical school Dean Larry Laughlin. "I have every reason to believe that we have found the highest quality military physician to serve as a role model for our students."

The Temple University Medical School graduate has over 12 years' experience in emergency medicine, including four years spent at USU, where she developed and served as faculty for the introductory emergency medicine didactic course.

Lawrence's last assignment before returning to USU was in the emergency department at Malcolm Grow USAF Medical Center, Andrews Air Force Base, Md. •

AFRRI Gets New Scientific Director

Terry C. Pellmar, Ph.D., was appointed as the Armed Forces Radiobiology Research Institute's new scientific director in September.

Prior to joining the AFRRI staff, Pellmar served as director of the Board on Neurosciences and Behavioral Health at the Institute of Medicine of the National Academy of Sciences in Washington, D.C.

The new scientific director earned her doctoral degree in physiology and pharmacology at Duke University in 1977 and subsequently completed postdoctoral training at AFRRI and at the National Institute of Alcohol Abuse and Alcoholism. Pellmar returned to AFRRI as a full-time research physiologist and



AFRRI, David Morse

later assumed the position of chief project manager of the neurophysiology program. In 1995, Pellmar was appointed as chairman of the radiation pathophysiology and toxicology department and was co-team leader of the nuclear/biological/chemical interactions and countermeasures team before moving to the Institute of Medicine. •

Multi-Million Dollar Cystic Fibrosis Research Award

Harvey B. Pollard, M.D., Ph.D., professor and chair of the Department of Anatomy, Physiology and Genetics, is the principal investigator for a National Institutes of Health-sponsored study on the proteomics of cystic fibrosis. The award is worth \$12.7 million over a seven-year period.

The goal of the project is to identify proteins whose expression and function is significantly increased or decreased in cystic fibrosis. The rationale is that identification of such proteins will provide information crucial for the development of new clinical diagnostics and the discovery of new drugs to treat cystic fibrosis.

Cystic fibrosis is the most common autosomal recessive lethal genetic disease affecting the U.S. population, with one out of every 1,600 live births afflicted. A cystic fibrosis patient carries two copies of a mutant cystic fibrosis transmembrane conductance regulator gene, and approximately

five percent of the population carries at least one mutant CFTR gene. The average cystic fibrosis patient dies at the age of 28, primarily through lung inflammation, infection and failure.

Faculty co-investigators and consultants at USU include Greg Mueller, Ph.D., David Jacobowitz, Ph.D., Meera Srivastava, Ph.D., and Ofer Eidelman, Ph.D., of the anatomy, physiology and genetics department, and Lee Metcalf, Ph.D., microbiology and immunology department. The Center for Medical Genomics and Proteomics is the armature for this program, featuring a world-class mass spectrometry facility located in USU's Biological Instrumentation Center. •



Two New Clinical Research Centers Open at USU

A cast of noteworthy individuals joined representatives of USU in separate ribbon-cutting ceremonies for new clinical research centers supported by congressional funding.

USU's **Post-Polio Syndrome Program clinic** will house a multi-center study to find the cause of Post-Polio Syndrome and study treatment options for the affected patients. It will include both military and civilian participants and represents a collaboration of USU, Walter Reed Army Medical Center, the National Institutes of Health, National Rehabilitation Hospital and the Conemaugh Health System in Johnstown, Pa. The clinic is part of the university's Clinical Neuroscience Laboratory, which also includes the Spinal Cord Injury Program clinic. Staff of both clinics will use the lab to conduct research project designs, program administration, patient evaluation/physicals,

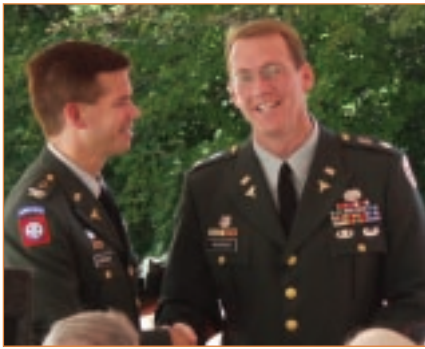
collection of specimen samples, data analysis and management, and sleep studies.

Post-Polio Syndrome refers to a new onset of symptoms occurring in people with a past history of polio. With roughly 1.6 million polio survivors in the United States, this syndrome affects one in five of them. Its symptoms develop over time and can be confused with aging. People with this chronic condition experience increasing disabilities related to fatigue, muscle weakness, joint pain and sleep disturbances.

Hosted by Col. Craig D. Shriver, director and principal investigator, Clinical Breast Care Project, and associate professor of surgery at USU, the **CBCP's Immunology and Research Center** opened in building 139 on USU's campus. It is the latest structure built or renovated to support the CBCP, a congressionally mandated civilian-military breast care and research partnership. The 7,500 sq. foot, state-of-the-art research facility has high-end immunologic

assay equipment and tissue banking capabilities. It joins three other structures, now totaling over 50,000 sq. feet, including the WRAMC Comprehensive Breast Center, the Windber Research Institute and Joyce Murtha Breast Care Center in Windber, Pa. The CBCP is a collaborative effort of USU, WRAMC, the Windber Medical Center and Windber Research Institute, and the Henry M. Jackson Foundation for the Advancement of Military Medicine.

The CBCP's facilities now stand as a premier translational and basic science research and clinical care paradigm for breast cancer. The IRC currently houses the Vaccine Development and Mutational Load Study research arms of the CBCP. In the near future, multi-peptide research studies and enhanced proteomic studies will be conducted. •



Col. Craig Shriver and Lt. Col. George Peoples



Remote Access to Medical Publications for Alumni

One of the biggest complaints voiced by uniformed health care professionals is the lack of adequate accessibility to professional journals and other publications from their small hospitals, clinics, field units or shipboard medical departments.

USU's Learning Resource Center now offers remote computer services – a collection of electronic journals, books, indexes to medical literature, e-mail subscriptions, military medical content and continuing education resources – free to alumni. The

library's ever-changing system features more than 5,000 full text journals and 90 textbooks, MD Consult, Micromedex, evidence-based medicine tools and much more.

Copies of theses and dissertations written by USU alumni are also available, in portable document format, through remote computer services. Graduates whose master's theses or doctoral dissertations are not on file in the Learning Resource Center database can add their

work via an electronic file to kcaron@lrcm.usuhs.mil.

USU alumni may apply for a remote computer services account on-line by visiting <http://www.lrc.usuhs.mil/register/>. •



Radiation Threats and Radioprotectants



"Nuclear catastrophe was hanging by a thread ... and we weren't counting days or hours, but minutes."
— General Anatoly Gribkov, former Soviet Army Chief of Operations

Forty years ago, the world watched in nervous anticipation as the United States and the Soviet Union stood on the brink of nuclear war following a Soviet build-up of nuclear missiles off the coast of Cuba.

For 13 days U.S. troops stood on high alert status, and Soviet forces were poised and ready for a tactical missile launch, while leaders of both countries worked to strike a compromise that would avert disaster.

Four decades later, long after the end of the Cold War, the threat of possible nuclear weapons use still exists, with more than 20 countries identified as possessing the capability, along with the fear that it lies in the hands of terrorists such as Osama bin Laden.

Now, however, scientists at the Armed Forces Radiobiology Research Institute are developing a drug that they believe may help enhance survival of troops or civilians exposed to high level doses of radiation, either by accident or through terrorist activity or war.

From the days of the Cuban Missile Crisis to the present, according to AFRRI scientist Mark Whitnall, Ph.D., the question has been posed, “What can we do to help soldiers exposed to high level radiation?” In response, researchers began looking at a variety of options that might offer protection from the deadly rays that cause defects in immune function and increased mortality due to infections and hemorrhage.

The Walter Reed Army Institute of Research had developed amifostine as a possible radioprotectant. Although it is used in the clinical setting in patients undergoing radiation treatments for cancer, the side effects of hypotension and nausea make it unsuitable for use in the field. Whitnall turned to steroids as radioprotectant candidates, including the anti-aging adrenocortical hormone dehydroepiandrosterone, or DHEA. However, this steroid exhibited no radioprotective efficacy.

He learned of research conducted by Dr. Roger Loria at Virginia Commonwealth University in Richmond using the immune

system-strengthening steroid hormone 5-androstenediol, which was shown to increase resistance to bacterial and viral infections in rodents. Loria holds the patent on the steroid hormone, and Hollis-Eden Pharmaceuticals in San Diego acquired the intellectual property rights to it. AFRRI then contacted Hollis-Eden about partnering in the development of a radioprotectant.

Whitnall and his colleagues at AFRRI, Drs. Tom Seed and Jimmy Pendergrass, welcomed the expertise of Hollis-Eden in negotiating the process of drug approval through the Food and Drug Administration. The company had extensive experience in conducting clinical trials with other steroids, and a partnership was formed. “Hollis-Eden has been very valuable,” Whitnall said.

The scientists at AFRRI subsequently took Loria’s studies further by examining 5-androstenediol’s ability to promote survivability in mice following exposure to whole-body ionizing radiation.

In the laboratory, Whitnall said, between 80 and 100 percent of the mice treated with 5-androstenediol survived infection after radiation doses that had killed all of the placebo-treated mice. He found that the steroid hormone stimulated the proliferation and differentiation of bone marrow progenitors of infection-fighting white blood cells.

In addition, 5-androstenediol exhibits very few side effects, unlike many of the other radioprotectants tested by the scientists. Rodents given 100 times the efficacious dose showed no signs of toxicity.

Whitnall and his colleagues found that 5-androstenediol induces proliferation of progenitors for granulocytes and monocytes in bone marrow, which is correlated with increased numbers of these cell types found in the general circulation after treatment with the drug.

In a recent paper in *Radiation Research*, the AFRRI group published their findings in which they used flow cytometry to analyze cell number and function after treatment of mice with 5-androstenediol and exposure to whole-body gamma-irradiation. Radiation alone, at a dose of 3-gray, caused reductions in numbers of circulating granulocytes, monocytes, and natural killer cells to half the normal levels when measured four days after irradiation. Pretreatment with 5-androstenediol prevented the drops in cell numbers.

In addition, either radiation or 5-androstenediol alone stimulated NK cells to a higher level of activity, as indicated by surface expression of the molecule CD11b. Moreover, there was a synergistic interaction between 5-androstenediol and radiation: CD11b expression on NK cells was markedly higher in mice exposed to both the drug and radiation. Since NK cells have been implicated in enhancing resistance to neoplastic disease, 5-androstenediol is being considered as a possible countermeasure to radiation-induced cancer. Other steroids in the same family have been found to have anticancer effects.

The drug is easy to store at environmental or room temperatures, does not need refrigeration, and has a long shelf life. Whitnall said the aim would be to administer the drug once, in advance, to soldiers who run the risk of radiation exposure, with the protective effects lasting one day. Troops exposed first could still take the drug up to one or two hours after exposure, he explained.

However, because it is being developed initially for military use in troops, against the threat of radiation exposure, the drug cannot be tested on humans. According to Whitnall, preliminary discussions with the FDA have indicated that it is an excellent candidate for a new rule dealing with drug candidates whose efficacy cannot be evaluated in humans for ethical reasons. Further pre-clinical testing will be conducted in higher mammals,



Researcher Vilmar Villa

including non-human primates, while humans will be used in safety testing only.

“It will be a good drug for helping soldiers in the field,” Whitnall said. “But it’s at least three years off. We’re conducting studies still and need to do human safety testing.”

5-androstenediol would eventually be used in conjunction with other radioprotectants and therapies in development at AFRRI and elsewhere.

Whitnall said AFRRI has been promised \$3 million in research funds this year by the Department of Defense, and \$3 million the following year for development of 5-androstenediol. — Sharon Willis •

Radiation Diagnostic Software Developed at AFRRI

The Armed Forces Radiobiology Research Institute has recently developed a new software program that may help healthcare providers gather and analyze patient information collected after a radiation incident.

The Biodosimetry Assessment Tool equips healthcare providers with diagnostic information such as clinical signs, symptoms and a measure of how much radiation the patient absorbed.

This software may help make data collection, integration and record keeping of an exposed person easier. It may also help healthcare providers improve care of military and civilian radiation casualties.

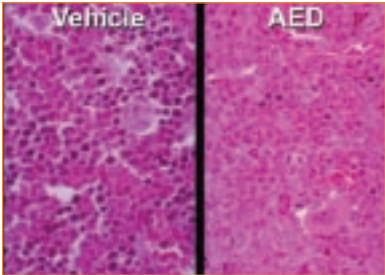
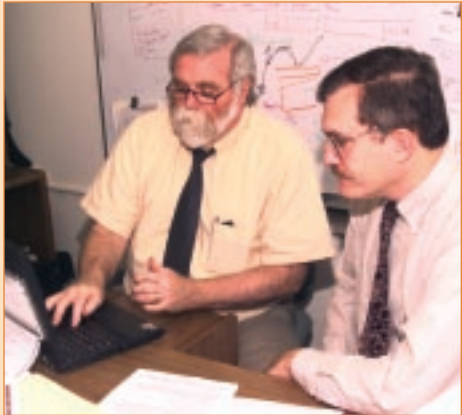
“The BAT software application compares the patient data entered into templates with radiation dose responses documented in the scientific literature. It then provides multiparameter dose assessments on which to base medical treatment and management decisions,” said Dr. William Blakely, BAT project manager and biodosimetry team leader.

“The program archives clinical information (extent of radioactive contamination, wounds, infection, etc.) and displays relevant diagnostic information in a concise format.

The scope of this program is to provide information in a concise, summarized form to physicians so they will be able to make the appropriate decisions,” Blakely added.

According to Ira Levine, a computer scientist at AFRRI, the application, distributed on a single CD-ROM, is about six megabytes, small enough for use on almost any 32-bit Windows computer. Any Windows-based platform can be used to download the program.

“Among its (BAT) features is an integrated, interactive human body map that permits convenient documentation of the location of a personnel dosimeter, radiation-induced erythema, and radioactivity detected by an appropriate device. In addition, the program archives collected information for later use,” said Levine. — JO2 Robert Keilman •



Scientists test the efficacy of 5-androstenediol (right) against the effects of radiation.

The Threat of Emerging Infectious Diseases

In the early 1990s, medical officers aboard the USS Saratoga were inundated with visits to sickbay by sailors exhibiting symptoms of viral gastritis. In all, over 70 crewmembers grew ill, forcing the commanding officer to impose a “stand down,” or a halt in the ship’s daily operations, to accommodate the loss of crucial manpower. The culprit: salmonella.

The bacterial outbreak on the Saratoga had a significant impact on the commanding officer’s ability to carry out his mission. In so many of the areas of the world beset with conflict and political instability, parasitic, bacterial, fungal and viral infections pose similar threats to deployed military forces and public health.

Recognizing that these serious challenges to military personnel demand a strong response, USU created an innovative interdisciplinary graduate program in emerging infectious diseases, the first of its kind in the nation, according to program director Eleanor Metcalf, Ph.D.

Metcalf said the concept for the emerging infectious diseases program came from now-Dean Emeritus Val Hemming, whose medical specialty is pediatric infectious diseases. Hemming sought to find a way to take advantage of the infectious diseases expertise among USU’s faculty, and formed a committee to explore possibilities for not only utilizing the expertise, but also to “build a bridge between the clinical and basic scientists,” Metcalf said. “So that we were all on the same road, traveling together.”

After a year of collaboration, the idea for the program was presented to Hemming for approval, and later to the university’s board of regents for their consent. Metcalf was selected as the program chair, and in the fall of 2000, the first graduate students began classes.

The first two years are designed around a core curriculum. Starting in the third year, students follow their chosen specialty path from one of three tracks: microbiology/immunology, pathology, or preventive medicine/parasitology. Metcalf said that it allows students, regardless of their area of expertise or interest, to have a “grounding in the interdisciplinary area” and provides them with the main components for understanding an infectious diseases

environment, whether during an epidemic or in the general population.

The program, according to Metcalf, addresses issues relevant to the military, in particular with regard to the current focus on bioterrorism, biowarfare, and biodefense. Many of the organisms being studied by students, faculty, and investigators are considered category A or B potential bioterrorism agents by the federal government.

Among those being researched are critical toxins released by ubiquitous strains of water- and foodborne enteric bacteria, such as E. coli O157:H7, that place soldiers and others at risk for serious infections. Scientists hope to define the pathogenic mechanisms that cause disease, its life-threatening kidney dysfunction among children, and its potential use as a biological warfare weapon.

In addition, researchers are developing a new animal model of human influenza, using the cotton rat, which is easily infected with the unadapted virus. They are hoping to determine the role of surfactants in viral-induced lung injury, the potential benefits of anti-inflammatory therapy for primary influenza infection and variations in the inflammatory response to different influenza virus.

Emerging infectious diseases investigators are also looking at anthrax, dengue virus, HIV, tuberculosis, shigella, and salmonella, among many others, to assess the threat to military troops and to develop military-relevant vaccines. “If health is a major issue of combat readiness, knowing about a disease’s contributions to morbidity and mortality is important,” Metcalf said. “If there’s no vaccine, it could devastate a large group quickly.”

The emerging infectious diseases program is unique in that it offers an opportunity for pediatric infectious diseases fellows to attend classes, including the “Models of Emerging Infectious Diseases” course that incorporates instruction on the clinical and basic science aspects of five diseases each quarter, 20 in total. The fellows, all physicians, also conduct research in the laboratories of

the program’s faculty. The interaction between graduate students and the infectious diseases fellows is invaluable, according to Metcalf, who says that the physicians often relate what they are studying in the classroom and laboratory to patients they have seen in practice.

Metcalf said her next goal is to bring adult infectious diseases fellows into the program, “with the idea of USU providing opportunities for pediatrics and adult ID fellows and expanding USU’s educational acumen.”

Another of the program’s unique aspects, Metcalf said, is its faculty. “The faculty are from USU, WRAIR [Walter Reed Army Institute of Research], NMRC [Naval Medical Research Command] and USAMRIID [U.S. Army Medical Research Institute of Infectious Diseases]. As a consequence, the contributions of a wide array of experts give students a unique educational opportunity,” she said. Among those with ties to the program is Dr. James Hughes of the Centers for Disease Control and Prevention in Atlanta. Hughes, the director of the National Center for Infectious Diseases, has agreed to serve as an active consultant as a member of the program’s external review committee.

In keeping with the rationale for its development, USU’s emerging infectious diseases program is preparing research and clinical scientists and clinical specialists to provide state-of-the-art health care for military personnel, to work and conduct research in the Department of Defense’s domestic and overseas research laboratories, and to provide timely and informed consultation to military commanding officers in operational units.

— Helaine Ahern •

Research Leads to West Nile Carrier

In the last two years alone, according to the Centers for Disease Control and Prevention, West Nile Virus in the United States has caused 249 deaths and resulted in over 5,000 confirmed cases in 32 states and the District of Columbia.

The virus, transmitted by mosquitoes, has been present in western Asia, Africa, and southern Europe for a number of years, and although scientists were aware that the insects spread the virus, they were not sure which species were able to transmit it.

USU graduate Maj. Michael Sardelis (Ph.D. Zoology ’01) was assigned to the virology division of the U.S. Army Medical Research Institute of Infectious Diseases at Fort Detrick, Md., during the summer of 1999



when samples from the epicenter of a mysterious outbreak in the northeast were brought in for examination. The samples were eventually determined to be West Nile Virus, and Sardelis recognized an opportunity to study the disease new to American soil.

Several months later, Sardelis entered USU’s graduate program in zoology and took on West Nile Virus as a dissertation project, realizing that his research could be very important.

He evaluated the vector competence of five species of mosquitoes; that is, he worked to determine which species might transmit West Nile Virus biologically. Laboratory studies were conducted to determine the mosquito’s susceptibility to infection with West Nile Virus, evaluate the permissiveness for virus replication in the mosquito, determine the period of time from virus uptake by a mosquito to when the mosquito can transmit the virus by bite, and to estimate the overall transmission efficiency.

According to Sardelis, not all mosquito species transmit West Nile Virus with the same efficiency. If public health personnel have available information on transmission efficiency – in addition to data on the bionics (for example, host preference, seasonal abundance, flight range) and distribution of a potential vector – they may be better able to quantify risk for West Nile Virus transmission by a particular species and target control measures.

Sardelis found that two of the five species he evaluated, *Ochlerotatus japonicus* and *Aedes albopictus*, were efficient laboratory vectors for West Nile Virus.

Recently, West Nile Virus was found in the *Ae. albopictus* in Maryland, adding heightened relevance to Sardelis’ findings.

— Sharon Willis •



A large, light blue illustration of a human brain and spine, positioned vertically on the left side of the page. The brain is at the top, and the spine extends downwards, ending in a pelvis-like shape at the bottom.

Brain and Spinal Cord Injury Prevention

By virtue of their jobs, U.S. service members around the world are at risk of life-threatening injuries. Whether fighting enemy forces in austere locations, jumping from aircraft during real-world events or training exercises, or working with heavy equipment and weapons, troops face possible brain and spinal cord injuries.

Neurotrauma includes closed head injuries, resulting in concussion or coma, and traumatic brain or spinal cord damage from penetrating wounds, which can lead to death. USU's researchers are investigating the causes, prevention and treatment of such injuries to the central nervous system and how to enhance pre-hospital care for military neurotrauma patients.

The Defense and Veterans Brain Injury Center and the USU Neurotrauma Research Laboratory encompass research on the care of veterans and family members with neurotrauma injuries as well as comprehensive basic and clinical research on brain and spinal cord injuries – a leading combat casualty, explains U.S. Army Lt. Col. James Ecklund, chief and residency program director at the National Capital Consortium and USU's chief of neurosurgery.

In both programs, active duty military physician-scientists (representing all branches) as well as civilian physician-scientists clinically treat neurotrauma patients in their roles as trauma surgeons or neurosurgeons, critical care intensivists, neurologists, psychiatrists or anesthesiologists. Many group members have front line experience in Afghanistan, the Persian Gulf, Bosnia, Haiti, fleet and overseas deployment, including delivery of medical care at all levels, from battalion aid station to fleet hospital as well as experience with airborne, ranger and special forces. In addition, members are extensively involved in basic and clinical neurotrauma research.

Through the unique combination of education, research expertise and military experience, the group delivers the right focus on military relevant medical issues.

Defense and Veterans Brain Injury Center

The DVBIC delivers patient care, conducts clinical research and develops educational programs primarily in the area of closed head injuries, including concussion as may be experienced by paratroopers. Dr. Deborah Warden, national director, leads a DoD and Veterans Administration consortium of seven participating lead medical sites. The military sites are Walter Reed Army Medical Center, Wilford Hall USAF Medical Center and Naval Medical Center San Diego, while the hospitals include Richmond, Tampa, Palo Alto and Minneapolis.

The DVBIC was brought into existence in 1992, originally as the Defense and Veterans Head Injury Program, by Congressional funding to establish a disease management system that would be “oriented to treatment, rehabilitation and care management.” The initial clinical trial at Walter Reed was an outcome study of hospital based cognitive therapy compared with home based care for patients with moderate to severe head injuries.

The study demonstrated that those who were most severely injured – people who had been unconscious for more than one hour – fared better if they were in the hospital program. Individuals with less than an hour's loss of consciousness who were sent home with a weekly call from a master's level psychiatric head injury trained nurse experienced the same outcome (fit for duty at one year after treatment) as those treated in the hospital program.

“It's a very significant contribution to both military and civilian medical care, because now we have data regarding patient outcomes to direct treatment decisions using our limited medical dollars,” Warden said.

In the past decade, they have seen hundreds of patients and a variety of injury types. The disease management system ensures the continuum of care from battlefield to VA hospital to community re-entry if needed or back to duty.

DVBIC clinical research projects cover a range of activities including medication protocols and cognitive rehabilitation. Having a network of DoD and VA hospitals permits a range of treatment protocols. “A significant portion of those individuals come back to us and are able later to go back to duty,” Warden explained. “So, it's not just a one-way street.”

Currently, the DVBIC researchers are involved in a study at Fort Bragg, N.C., to design protective interiors for paratroopers' helmets that will increase protection against closed head injury. “Paratroopers are jumping with an excellent helmet now,” Warden explained. “What we're doing is trying to cut down the level of injuries there are because of the increased risk to military paratroopers jumping out of planes. They jump in austere locations and typically at night ... it's not like someone going out on a Saturday for a recreational jump, where all the conditions have to be right.” Conducted in collaboration with the U.S. Army Aeromedical Research Lab at Fort Rucker, Ala., the study has identified two helmet liners, which must now be tested in the field.

Another study is being conducted at the U.S. Military Academy where the cadets are involved in a variety of sporting events that can cause injuries. The DVBIC staff goes to West Point every summer to do a cognitive computer screen on each new cadet. “We get a baseline test for each cadet so that if they are then injured, we can compare their cognitive performance to their own baseline,” Warden explained. She added that they also do this for the soldiers at Fort Bragg. This research will culminate in a brief screen and guidelines for returning to full activity following concussion.

USU Neurotrauma Research Laboratory

The USU Neurotrauma Research Laboratory was initiated here close to five years ago to study brain and spinal cord injuries to military members in combat and austere locations. Ecklund and Army Lt. Col. Geoffrey S. F. Ling co-direct the program.

According to Ecklund, “there's great research already being conducted in the civilian community for the hospital treatment of head and spinal cord injury resulting from common mechanisms seen in a civilian setting. In contrast, those of us in uniform have a vested interest and a responsibility to address the questions related to caring for neurologically injured soldiers, sailors, airmen, and Marines in a battlefield environment. For example, 80 to 90 percent of head injuries seen in a combat environment are penetrating injuries, whereas 80 to 90 percent of head injuries in the civilian sector are closed. While there are many robust research efforts investigating questions related to closed head injury in this country, there is no substantial basic science research being conducted on penetrating



injuries. Additionally, the austere nature of the battlefield combined with resource limitations and delays in evacuation create an environment almost never encountered in the civilian sector; although mass casualty scenarios can parallel these military challenges in a number of ways. Future advances in medical care for battlefield patients will rely heavily on innovations that improve care in a pre-hospital or minimal hospital setting pending definitive evacuation.”

Relevant to the military mission, the researchers developed a model of penetrating brain injury. “Like our civilian counterparts, we use the well described fluid percussion model to study closed head injury,” Ling noted. “However, as 90 percent of combat related CNS (central nervous system) injury is due to a penetrating lesion, the majority of our effort is focused on open head injury. Again, relevant to combat casualty, we are studying the effects of extreme physiologic conditions as would be expected under battlefield conditions. How these conditions affect the injured CNS is important as military patients, unlike their civilian counterparts, are expected to have significant delays in evacuation to advanced medical care, as much as 96 hours under projected operational doctrine. Thus, better treatments suited for the austerity of the far forward environment are needed.”

As part of their clinical studies, the physician-scientists are developing clinical tools that can be used by combat provide simple clinical examination techniques to enable medics, who have minimal medical training, to assess the neurologic state of injured warfighters.”

Two promising technologic devices under study are a radio frequency triage tool, RAFT, and a wearable comprehensive physiologic monitor, called a “Bioglove.”

Based on radio wave interrogation in the 0.5-6GHz range, RAFT has been developed to noninvasively image the brain and spinal cord. This device has been developed in collaboration with Biostar and RGR, a civilian engineering consortium. Evaluation of this device on an intact physiologic level is being conducted here.

The Bioglove, which is worn as a glove by the user, provides real-time information on EKG, respiratory rate, heart rate, pulse oximetry and body temperature. It also has the potential for integration with RAFT.

“If promising, a clinical trial will follow,” Ecklund explains. “The potential importance of these devices cannot be understated. Their application would allow rapid, portable and inexpensive evaluation of the wounded soldier on the battlefield. This can improve the care instituted at the

earliest stages; enhanced triage, treatment, and evacuation can optimize the neurologic outcome. At present, there is no equivalent counterpart to RAFT or the Bioglove in clinical practice.”

The other part of their research is clinical trials on promising technologies and therapies that have shown efficacy in the neurotrauma research program’s labs. Military medical treatment facilities (Walter Reed Army Medical Center, National Naval Medical Center, Malcolm Grow Air Force Medical Center) as well as selected civilian trauma centers (Fairfax Hospital, Johns Hopkins Hospital and others) are all involved. These same groups are positioned to begin study on promising innovative imaging technologies and pharmacologic agents.

The goal of military medicine is to provide the finest medical care to military service members. Ecklund, Ling and Warden agree that there must be an ongoing commitment to scientific research to ensure that appropriate advancements in medical care will be available for our country’s most deserving patients – those who have been injured in her defense. — *Tech. Sgt. Ann Bennett* •



Risks and Challenges Make a Rewarding Career

Lt. Col. Jim Ecklund’s job isn’t exactly brain surgery. In fact, it is also spine surgery, teaching, administration and research.

As chief of Walter Reed Army Medical Center’s Neurosurgery Service and USU’s Division of Neurosurgery, the class of 1987 alumnus sees over 700 cases a year. Like most neurosurgeons, Ecklund deals primarily with spine disorders, but the entire spectrum of neurosurgery, with the exception of stereotactic radiosurgery and extracranial carotid artery disease, is represented in his practice.

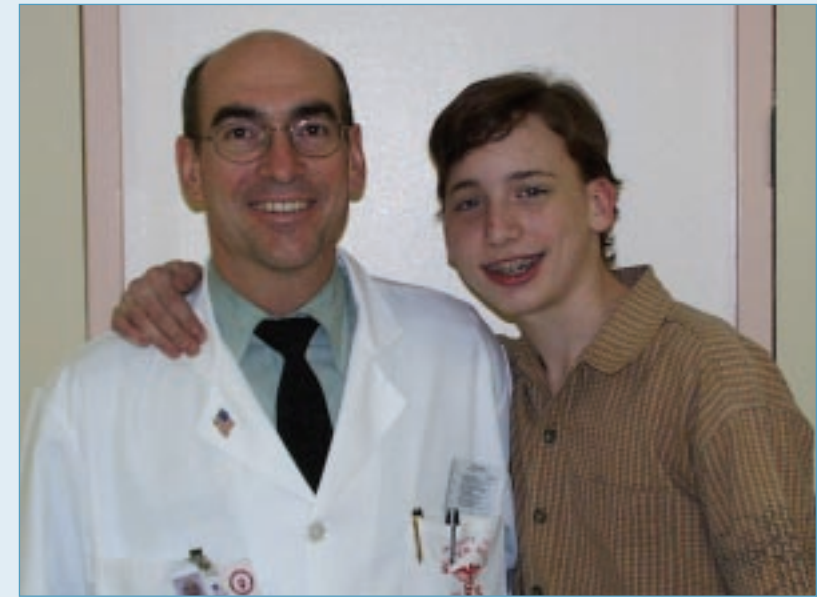
One of Ecklund’s higher profile cases involved operating on and caring for retired Army Gen. Henry H. Shelton, former chair of the Joint Chiefs of Staff, following a severe spinal injury incurred by the general after a fall from a ladder. Although Shelton’s case received a lot of media attention, Ecklund said from a medical standpoint it was not “particularly technically difficult.” In fact, he said, most neurosurgeons would agree that complex vascular cases such as giant aneurysms are much more challenging, “because of the risk of rupture, the time limitation if you need to temporarily clip the vessels, and the technical challenge of obliterating the aneurysm completely while still insuring patent flow in the parent vessel.”

More of a challenge, Ecklund said, was the case of 11-year old Jake Leffler. Leffler had been partially paralyzed on his left side for two years. Diagnosed with a giant three-to four-centimeter aneurysm, the boy was flown from Belgium, where his active duty Army father was assigned, to Walter Reed for emergency brain surgery.

“We have incredibly talented, bright and motivated residents,” he said. “And being a part of their development is an honor.”

Ecklund, assisted by Dr. Daniel Rigamonti, a neurosurgeon from Johns Hopkins University with significant experience in the procedure, performed the operation. A craniotomy was done, exposing the aneurysm, followed by surgery done by USU assistant professor Dr. Philip Corcoran to open the boy’s chest.

Leffler was put on a bypass and his body temperature lowered to 18 degrees Celsius (approximately 64.4 degrees Fahrenheit), stopping his heart. Doctors turned off the heart-lung machine, leaving them only a critical 45-minute window in the bloodless field to destroy the aneurysm while reconstructing its neck to preserve blood flow to the distal artery.



Dr. Jim Ecklund and Jake Leffler

It took the team 37 minutes in “hypothermic cardiac standstill” to complete the reconstruction using five aneurysm clips. The bypass machine was restarted for a two-hour rewarming process.

“Fortunately, Jake did very well,” said Ecklund. “His left hemiparesis resolved, and he is progressing in school well. This procedure carries a 40 percent major morbidity and mortality rate. His parents asked me to wear a pin of a saint that was special to their family on my scrubs during the case, which I gladly did. I still have a picture of the saint in my office.”

Saints are not the only ones providing guidance in the neurosurgery operating room. Ecklund’s third hat as residency program director gives him the opportunity to guide and train the next generation of military neurosurgeons. “We have incredibly talented, bright and motivated residents,” he said. “And being a part of their development is an honor.”

That, combined with “conducting research for the soldier” in the neurotrauma laboratory with Lt. Col. Geoffrey Ling, makes his work especially meaningful to Ecklund. “The most rewarding [aspect of the job] is having the privilege of caring for the brave men and women who defend our shores,” he said. “Conducting research for the soldier is extremely rewarding, primarily because we are filling a large gap that is clearly mission relevant, and we are starting to see some effects of our efforts that will benefit the men and women in the field.” — *Sharon Willis* •

Advancing Health Through Vaccine Research

More than 200 years ago, military medicine was grounded in a democracy where people believed that those who “go in harm’s way” deserved the best support their country could offer. Inducing smallpox immunity by inoculating the Army was one of the earliest examples of military medicine’s contributions to virology and immunology.

Over the centuries, military physicians continued to do vaccine research and care for their patients, recognizing the larger benefits for society and public health.

Microbiologists, immunologists, and other scientists at USU have continued this work to advance vaccine technology and products to prevent disease.

The Institute for Vaccine Research was established last year at USU in response to an idea conceived by Dr. Val Hemming. During his tenure as chair of the pediatrics department, Hemming was involved in the development of an antibody for Respiratory Syncytial Virus, or RSV, a serious health problem in the world’s pediatric population. When delivered properly, the antibody would protect babies against RSV.

Hemming worked with the biotechnology firm, MedImmune, to develop the product, which met with tremendous success. He wanted to use much of the royalty revenue coming back to USU to further vaccine research and felt it would be valuable for the university to have a lab for immunotherapy and vaccine development. The Institute for Vaccine Research resulted, based in the pathology department, and an endowment fund for research efforts was established.

Dr. Clifford Snapper, an immunologist and professor in the pathology department, was named the institute’s director. Laboratory and office space were donated by the pathology department, and Dr. Goutam Sen was hired as deputy director, along with several others recruited to fill the institute’s staff.

Although the institute is located in pathology, it is meant to be an inter-departmental endeavor, working with the pediatrics department, to develop novel, universal strategies for enhancing antibody production for poorly immunogenic proteins, peptides and polysaccharides. “These antigens serve as vaccine targets for many bacterial and viral pathogens of clinical relevance to both military and civilian populations,” Snapper said.

“Such agents,” he said, “include those naturally encountered in countries where military personnel are deployed as well as biological weapons delivered in the combat theater.”

“The institute’s goal,” he said, “is to coordinate efforts among creative military scientists and their counterparts in the civilian university sector who have expertise in basic and applied immunological research relevant to vaccine development.”

The institute is currently at work on two major projects based on preliminary research done by Drs. James Mond and Andrew Lees while both were assigned to the USU Department of Medicine. A cooperative research and

development agreement was formulated between USU, Biosynexus and the Henry M. Jackson Foundation for the Advancement of Military Medicine.

Infections due to extracellular bacteria and viruses continue to be a major cause of global morbidity and mortality, especially in the young and elderly, which are populations that have immature or weakened immune systems, respectively. Host protection against these pathogens involves the production of specific antibodies. There is a continued, urgent need to develop new vaccines that are efficient in boosting anti-bacterial and anti-viral antibody production in the host that will confer protection against these pathogens. The Institute for Vaccine Research is currently working on two approaches for boosting antibody responses in the host.

The first project involves using an Epstein-Barr virus protein called gp350 as a carrier for microbial protein and polysaccharide antigens. Gp350 has the unusual property of binding to a receptor (the complement receptor type 2) on several types of immune cells (B cells and follicular dendritic cells) resulting in the induction of strong antibody responses from markedly enhanced specific immune activation.

The second project involves the use of DNA-RNA hybrid molecules that are able to activate multiple innate immune cells such as macrophages and dendritic cells. Along with the ability of DNA-RNA hybrids to directly activate B cells as well, these molecules should also prove valuable for inducing antibody responses when used as carriers for anti-bacterial and anti-viral protein and polysaccharide antigens.

Both basic and pre-clinical studies are currently in progress to test the efficacy of these carriers for eventual use as vaccine formulations for clinical testing. The potential to combine these carriers with many different types of microbial antigens will serve to foster collaborations with vaccine laboratories nationwide. — Sharon Willis •



Paul Ling, Ph.D., (far right) and the members of his laboratory.

Linking Epstein-Barr to Cancer

Viruses may cause or increase the risk of malignancy through several mechanisms, including direct transformation of cells and/or expression of oncoproteins. Epstein-Barr virus (EBV), a versatile lymphotropic g-type human herpes virus, or Lymphocryptovirus (LCV), is associated with a wide variety of human malignancies including Burkitt’s lymphoma, nasopharyngeal carcinoma, Hodgkin’s disease, gastric carcinomas and others. EBV can directly transform human B cells in culture through expression of a subset of viral genes commonly known as latent genes. Identifying the functions of EBV latent genes that mediate B cell immortalization is a first step towards understanding the pathogenic role the virus has in these malignancies.

The long-term goal of this research program, led by USU graduate, Paul D. Ling, Ph.D. (’90), assistant professor of molecular virology at Baylor College of Medicine in Houston, is to understand how two EBV latent proteins, known as EBNA2 and EBNA-LP, contribute to EBV-driven B cell immortalization.

Ling and members of his laboratory are using genetic, biochemical and molecular approaches to understand the mechanisms by which these proteins function, identify the cellular cofactors required for these functions, and determine their role in virus-induced cellular proliferation. The knowledge gained from these studies may also lead to rational design of novel compounds that work by inhibiting EBNA2 and EBNA-LP activities as a primary therapeutic strategy in treating EBV-associated malignancies. •

Saving Daylight. . . Saving Lives

Two thousand U.S. troops were sent from a base in North Carolina to the Sinai desert, fulfilling their rapid deployment force mission of “anywhere in the world in 18 hours.” While the soldiers were ready fighting forces when they left, because of the effects of jet lag, they were self-described “zombies” upon arrival and for almost a week afterward. According to one soldier, “if we had to move, shoot and communicate immediately, our performance would have been degraded.”

A discovery by scientists in USU’s Department of Anatomy, Physiology and Genetics may eventually result in a treatment for jet lag and help optimize performance by deployed service members.

Researchers have been studying the eye for several hundred years. Santiago Ramón y Cajal, a famous Spanish neuroanatomist who is frequently referred to as the “father of neuroanatomy,” was the first to anatomically characterize the cells of the retina. Cajal’s work showed that the rods and cones were the only two types of photoreceptors in the retina, initiating sight by activating nerve cells that send signals to the brain. The rods are the cells responsible for vision at low light levels, while the cones are active at higher light levels.

His work, done around the turn of the 20th century, showing that rods and cones were the only photoreceptors in the eye, was long considered the standard until USU faculty member Dr. Ignacio Provencio and colleagues from the University of Virginia found that some mammals lacking rods and cones could still reset their internal clocks to light.

They showed that mice without rods and cones still adjusted their biological rhythms in response to light.

Dr. Mark Rollag, vice chair of the department, recruited Provencio to USU for a post-doctoral fellowship, and the two began their collaboration on research to identify a novel photopigment that could explain the mouse findings. A search for another photoreceptor was launched.

They searched for the protein in frogs, specifically in the frog skin cell because “it was easy to study in the lab,” according to Rollag. Their work showed that frog skin

Immunofluorescent labeling of melanopsin-containing retinal ganglion cells in a flat-mounted mouse retina. Cell bodies are indicated in red, dendrites in green, and axons in magenta. (Courtesy of József Czégé, Uniformed Services University)

cells responded to light using opsin photopigment, just like the visual photoreceptors use. A closer look into the frog eye by the pair revealed the phantom photoreceptor, which they named “melanopsin” for its location within the skin pigment cell.



Ignacio Provencio, Ph.D., and Mark Rollag, Ph.D.

Rollag checked for melanopsin in chickens and Provencio found it in mice. Using that data, they looked for the protein in humans and found that they were on to something. According to Provencio, it looked just like some of the cells he found using independent technology while a graduate student at the University of Virginia. The photoreceptor was found in the retina, but not in the rods and cones. The expression in the eye of the mouse looked exactly like the ganglion cells that projected to the biological clock, suggesting it may play a role in regulating the body clock. Provencio called it his “Aha! moment.”

Using a marker for melanopsin cells in the retina, they identified a “photoreceptive net,” a new light-detecting apparatus in the retina. “Discovering this new mechanism for photoreception was totally unexpected,” said Rollag.

“This was a bonus. It was like turning over all these rocks and all of the sudden there was \$100.”

Based on their work, other scientific laboratories around the world have extended their findings and have shown that melanopsin-contained ganglion cells are photoreceptors that are completely different than vision cells, but still found in the eye.

Provencio said they are now pursuing the expression of

“Discovering this new mechanism for photoreception was totally unexpected,” said Rollag. “This was a bonus. It was like turning over all these rocks and all of the sudden there was \$100.”

melanopsin and its role in regulating circadian rhythms. As predicted, Rollag and Provencio found that melanopsin does play a role in resetting the body’s clock, and this past February, scientist David Berson and colleagues from Brown University proved their prediction that these melanopsin-containing cells are indeed directly sensitive to light.

According to a report on the subject featured in the *Harvard Gazette*, “light is a mixture of different frequencies, or colors.” By determining the frequency needed to reset the internal clock after it has been “knocked out of synch by travel across time zones,” scientists could, indeed, develop a “cure” for jet lag.

A step that can’t come soon enough for soldiers facing deployment, whose training schedules and missions are frequently modified to alleviate the sluggishness associated with jet lag.

The bottom line, according to one soldier, is that “not having to acclimate or adjust the clock could ultimately save lives.”

— Sharon Willis •

Findings

Cardiologists Participate in National Study

Faculty members in USU's Department of Medicine were among 100 physicians and researchers nationwide who participated in a study centered at the University of Rochester (N.Y.), and spread over 60 test sites, that looked at the use of implantable cardioverter defibrillators in patients with a history of heart attack.

Working from the National Naval Medical Center in Bethesda, Md., Mark Haigney, M.D., an associate professor in the medicine department, Lt. Cmdr. Michael Illovsky, MC, USN, an instructor in medicine,

The device, brought to the public's attention after Vice President Dick Cheney had one implanted last year, is designed to monitor electrical signals in the body and check for abnormal heartbeats. A heart attack occurs when a blood clot forms in an artery leading to the heart, causing muscle to be deprived of oxygen and nutrients. The affected section of heart muscle then dies. This can trigger electrical problems leading to cardiac arrest, during which the heart stops pumping blood, in up to one-third of heart attack victims. Between 250,000 and 350,000 (non-hospitalized) people in the United

States suffer cardiac arrest every year, and most of them die. During a cardiac event, the ICD immediately shocks the heart, sending it back into a normal rhythm.

The heart pumps out about 55 percent of the blood in its chamber with each beat. The percentage of blood that leaves the heart during systole, or the contraction phase,

and Lt. Cmdr. William Finneran, MC, USN, an assistant professor of medicine, took part in the five-year Multicenter Automatic Defibrillator Implantation Trial II (MADIT-2) study that was designed to evaluate the effect of an implantable defibrillator on survival in high risk heart attack patients.

is known as the "ejection fraction." Participants in the MADIT-2 study were those with heart ejection fractions of 30 percent or less.

The study found that patients who had previously suffered a heart attack and whose heart pumping power was significantly reduced had



a greater chance of surviving another attack if they had been given an ICD. In fact, according to the study results, the risk of dying was reduced by one-third, a reportedly significant milestone in cardiac care.

Carrying the study results one step further, the USU faculty members are seeking ways to identify those participants who drew the greatest benefit from the use of the ICD. According to Haigney, a sub-study being conducted at USU would try to identify the ten percent of MADIT-2 study subjects at highest risk for dying. By reviewing recorded digital electrocardiograms from the 1,232 test patients using a specially-designed computer program, they hope to isolate those subjects who, based on abnormalities hopefully discovered on their recordings, may be more prone to have another cardiac event.

Under the study guidelines, 400,000 people in the United States are currently eligible to get the ICD – an estimated cost of \$10 billion per year. Isolating the small percentage of patients who face the greatest risk of death, and implanting the device only in them, would result in a significant cost savings to the American public. •

Recent Publications and Lectures

Emmanuel G. Cassimatis, M.D., associate dean for clinical affairs. *The Journal of the American Academy of Psychoanalysis*, Winter, 2001, 29:4. "On the Frame of Reference in Psychotherapy and Psychoanalysis."

Michael Battistone, M.D., Charles Milne, M.D., Merrill Sande, M.D., from the University of Utah, and USU faculty members Louis Pangaro, M.D., Lt. Col. Paul Hemmer, USAF, MC, and Thomas Shoemaker, M.D., co-authored, "The feasibility and acceptability of implementing formal evaluation sessions and using descriptive vocabulary to assess student performance on a clinical clerkship," which appeared in *Teaching and Learning in Medicine* 14(1):5-10, 2002.

Kimberly Byrnes, graduate fellow, Department of Neuroscience. *Science Next Wave*, Aug. 16, 2002, "ANDP Fellows: changing graduate education policy in neuroscience programs."

Capt. Thomas Grieger, MC, USN, was a participant in an Air Force-sponsored support mission for the Republic of South Africa Defense Forces in Pretoria, South Africa. He spoke on medical and psychological effects of chemical and biological weapons, consultation to command and civilian leadership, military medical response to the Pentagon attack, and psychological aspects of body recovery and identification missions.

Don Rigamonti, Ph.D., was a finalist in the American Association of Nurse Anesthetists, Assembly of School Faculty Crystal Apple Award. This award recognizes excellence in innovative classroom teaching techniques. His entry describing the use of virtual reality for teaching anatomy to nurse anesthesia students was one of only three nationwide finalists. •

Pharmacology Researcher Receives National Grant

Suzanne B. Bausch, Ph.D., assistant professor in the Department of Pharmacology, has been named the recipient of a national research award from the Epilepsy Foundation. Bausch will explore how miscommunication between neurons in the brain leads to seizures.

"Research grants stimulate epilepsy research by providing funding for investigators in the early stages of their careers. Seed grants are awarded to clinical investigators or basic scientists for support of biological behavioral research that will advance the understanding, treatment and prevention of epilepsy," said Gregory L. Barkley, M.D., chair-elect of the Epilepsy Foundation's Professional Advisory Board.

Bausch's project entitled, "Activity and NMDA Receptor Activation in Epileptogenesis," will investigate the association between the development of epilepsy and formation of abnormal synapses, or the narrow gap between cell structures that send and receive electrical impulses in the brain.



The one-year research grant is part of over \$2 million in research funds awarded by the Foundation this year. Bausch's research was selected in a competitive process through rigorous review by a panel of prominent epilepsy scientists.

The Epilepsy Foundation is a non-profit volunteer agency devoted to research, education, advocacy and services for the 2.3 million American citizens with seizure disorders and their families. •



Tyler Best, a Ph.D. student in the neuroscience graduate program, worked this summer with USU Professor Dr. Diane Borst to determine the cell types that express IRBP, a protein that binds and transports Vitamin A. Knowledge of IRBP's function could lead to improved clinical treatments for blindness due to Vitamin A deficiency.

Targeting Malaria at Home and Abroad

Within the last year alone, an estimated two to three million deaths worldwide were due to malaria. Combatting this global threat is important to the military since fighting forces are often deployed into areas where malaria is endemic.

Researchers at USU, led by Don Roberts, Ph.D., professor of tropical public health, are helping nations predict high-risk locations for malaria occurrence through satellite imaging and the use of geographic information system technology. The technology is used to predict malaria mosquito population levels and disease transmission risks within precise areas and time frames. NASA is the primary sponsor of this research.

Remote sensing and GIS technologies have potential for targeting and managing malaria vector control in Belize, a Central American country that experienced a resurgence of malaria in the mid-1990s. Through stratification, the country has reduced malaria rates since 1995. However, in 2000, Belize had to replace DDT with more expensive and less effective insecticides.

To make efforts more cost-effective, officials could increase the use of remote sensing and GIS technologies to more precisely target application of control measures. Past research in Belize has shown that these technologies can be used to identify favorable mosquito habitats through characterization of vegetation, bodies of water, and other environmental factors. This information, along with specific locations of human habitations, can help Belize's Ministry of Health pinpoint houses and high risk areas to reduce malaria control operational costs and the amounts of chemicals needed for effective levels of control. Once a functional GIS is developed for the whole country, it can also be used in other public health programs such as immunizations and dengue control.

Roberts, along with his USU colleagues, also headed an effort to keep DDT from being banned as part of the global POPs agreement to eliminate 12 persistent organic pollutants. Malaria workers around the world joined this campaign and, in the final agreement, DDT was set aside for use in disease control programs.



According to Roberts, it is an irrefutable fact that DDT is still the most cost-effective malaria control chemical and is still needed to stop malaria transmission among high risk populations. If banned, Roberts said, many more lives would be lost to this deadly disease.

In September, two confirmed cases of malaria were discovered in northern Virginia. In response, Roberts and his team helped local and state health authorities trap and test mosquitoes that might be harboring malaria. They collected and verified the presence of malaria-positive pools of mosquitoes from Selden Island. The island is part of Montgomery Co., Md., but is located on the Virginia side of the Potomac River. The USU team continues to provide technical and consultative expertise to authorities on this issue. •

Ninth Annual Research Day

The Graduate Student Research Colloquium and Research Day took place on May 15 and 16.

The event included symposia, workshops, exhibits and poster sessions, spanning the spectrum of research conducted at USU.

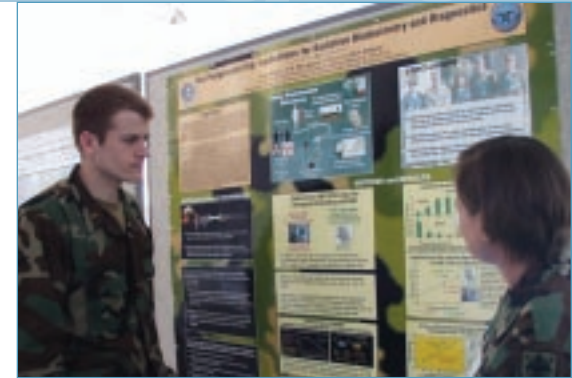
The first day was sponsored by the USU graduate faculty and graduate students to promote scholarly interchange between graduate students and the academic community. It also served to recognize the pursuit of research excellence by USU graduate students.

The John W. Bullard Memorial Lecture was given by Marc K. Jenkins, Ph.D. Jenkins is a professor in the Department of Microbiology at the University of Minnesota, and his topic was "Tracking the Generation of Memory CD4 T Cells in vivo." The lecture is named for John W. Bullard, Ph.D., who served as assistant dean for graduate

education from November 1976 to November 1990. It was under his leadership that the Graduate Research Colloquium was initially established.

Research Day activities featured several guest lecturers, including Rep. Saxby Chambliss (R-Ga.), who discussed the Congressional response to bioterrorism and its impact on research and training, and plenary speaker Robert S. Balaban, Ph.D., whose lecture was entitled, "Post-Genomic Research Environment: Putting the Cell Back Together."

An awards banquet was held, with honors going to Emma Ross for best poster. Eugene Levine, Ph.D., won the Faye Abdellah Award for Nursing Research; Sara Newman won for Best Graduate Student Poster and also earned \$500 as an honorable mention in the Emma Bockman Award competition. Joseph Nielsen also received a \$500 honorable mention prize, while



Thomas Ceremuga took home top honors and \$750 as the Emma Bockman Award recipient.

Department of Medicine faculty member and USU '81 alumna, Wendy Bernstein, and colleague Shao-Kui Wei, both earned the John Maher Award for Teaching and Research, while Ignacio Provencio, Ph.D., from the anatomy, physiology and genetics department won the Henry C. Wu Award for Basic Science Research and Andre DuBois, M.D., from the medicine department earned the James Leonard Award for Clinical Research. •

Pediatric Clerkship Recognized by APA

USU's third-year pediatric clerkship was recently recognized by the Ambulatory Pediatric Association for an Outstanding Teaching Award of 2002. This competitive award is given annually to a program selected from nominated civilian and military medical schools, residencies and fellowships in pediatrics nationwide.

According to the APA, this effort is intended "to foster interest in the teaching of ambulatory pediatrics by giving national recognition to an outstanding ambulatory pediatric program. Programs must demonstrate

excellence in educational teaching methods, acceptance by students and/or residents, acceptance by the community, or outstanding quality of the individuals trained in the program."

Stephen Ludwig, M.D., president of the APA, presented the award to Lt. Col. Jeff Longacre (USU '86), clerkship director and director of pediatric medical education, and Capt. Ildy Katona, chair, Department of Pediatrics. This marks the second



time USU's pediatrics department has received this honor, now earning the distinction of being the only institution to have done so. •

HJF Announces Recipients of Annual Fellowship Awards

Three outstanding graduate students were recently selected to receive fellowship awards from The Henry M. Jackson Foundation for the Advancement of Military Medicine. This program, established in 1998, provides stipend and travel support for Uniformed Services University graduate students entering the fifth year of study.



Brenda Elliot received the first Val G. Hemming Fellowship award (named for the dean emeritus of USU). She is a senior graduate fellow in the Department of Medical and Clinical Psychology. The focus of her research is behavioral and cognitive variables that alter recovery from brain injuries.

Kimberly Byrnes is a graduate student in the Department of Anatomy, Physiology and Genetics. Her research examines the effectiveness of low power laser irradiation in treating spinal cord injury and promoting regeneration of acutely transected corticospinal tract axons.



Nicole Vaughn is a graduate fellow in the Department of Medical and Clinical Psychology. The aim of her research is to develop treatments that promote weight maintenance after weight loss among African-American women.

USU Students Gain Deployment Experience

At USU, the curriculum calls for an operational clerkship during the summer after completion of the first year of medical school. Historically, the program has been aimed at those without prior military service, approximately one-third of the class. The events of Sept. 11, 2001, have triggered many changes throughout the military, and the operational clerkship program is one such change. This year, the entire class was invited to participate in an effort “to develop stewards of our nation.” The goal was to have the class find an experience that coincided with the mission of the university while staying within a limited budget. Many of the usual clerkship units were closed to students because of deployments, requiring the class of 2005 to get creative and innovative in searching for assignments.

Wings Level

On board the USS Nimitz, Ensign Stephen Pearson fully realized the dangers of working on the deck of an aircraft carrier. “The hazards on the deck of a carrier are endless: going overboard, jet exhaust, jet fuel and fuel lines, extremely loud noise, plane propellers, catapults, landing

wires, etc. It truly was something that can only be understood with experience,” says Pearson. The assignment on the USS Nimitz was the culmination of planning that started by completing the Navy’s aviation survival training courses at naval air stations in Patuxent River, Md., in March and in Norfolk, Va., in May, then spending three weeks in July in Lemoore, Calif., shadowing flight surgeons.

Pearson used his summer experience to help decide if he wants to become a flight surgeon. His experience with the squadron at the Naval Air Station Lemoore gave him “a chance to see what medical issues are prevalent in this (high performance aviation) operational realm.” Seeing the operational environment face to face, and learning to care for those who experience extreme stress levels like dehydration, sleep deprivation, depression, and upper respiratory and sinus infections was part of the mission. Being able to identify, help and empathize with these symptoms in the navy personnel is, in part, why the clerkship is part of the first year curriculum. “In light of recent issues in the world it is imperative that we, as physicians, understand what medi-

cine consists of in a deployed setting. We have to be prepared because it is not a matter of if, but rather when, we will be called upon to provide health care in a hostile setting,” Pearson said.

Urban Combat

At Camp Ederle in Vicenza, Italy, 2nd Lts. Matthew Agius, George Lin and Ryan Magra were training in urban combat, weapons, physical fitness, motor pool and anything else that the 508th Airborne Battalion unit was required to do. The students observed and trained with the Southern European Task Force, a rapid reaction airborne infantry unit.

“My time in the MIR (multi-purpose indoor range), at the shoot-house and just being with the soldiers in general taught me a lot about infantry life,” says Agius of the experience. Agius was able to qualify on several weapons and experience first hand what “trigger finger” (an infantry term used to describe the numbing of the index finger from the constant vibrations of a weapon) felt like. The “shoot-house” is a simulation of urban warfare, where platoons trained to get their men from the ground to a second story window

to seek shelter. It was during this training that the students observed most injuries, rope burns and falls. Agius was impressed with the sheer will of the soldiers. “(They) burned their hands to the point of bleeding from slipping and sliding down the rope they were climbing. I also saw a few guys fall about twelve feet flat on their back. Nobody admitted to being hurt and continued on as if nothing had happened.” The students also spent time with the brigade surgeon, Maj. Richard Malish ‘96, and with the commanding officer of the health clinic, Lt. Col. Richard Trotta ‘93.

Green Light!

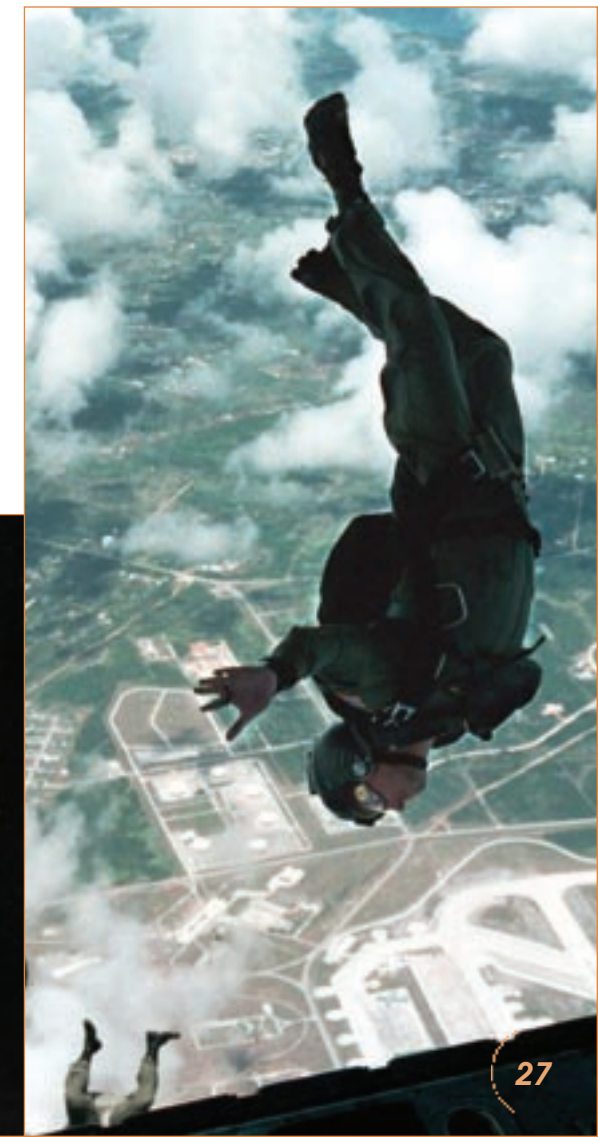
Jumping from an aircraft at 1,280 feet, 2nd Lts. Reed Kuehn, Chad Cryer and Johannah Kone qualified as paratroopers while attending Jump School at Fort Benning, Ga. The school was broken down into three weeks: ground week, which consisted of jumping out of a mock door, four people at a time, and practicing landing and falling by hooking a cable from a 34-foot tower; tower week, which advanced them to a 250-foot tower, fortifying the practice of landing and falling, mass exiting from an aircraft, air mobility and emergency malfunctions of the para-

chute and how to handle them; and jump week, where all the training is pulled together and the students perform four jumps, including a night jump. “The most exciting part was at the door waiting to jump, where it was extremely loud, then jumping into complete silence,” said Kuehn.

“We went to represent USU, complete the course and to gain knowledge for our futures,” says Cryer. “It was good to see the everyday life of the people who we will be taking care of and the conditions that they go through.” All three students gained an understanding of the importance of preventive medicine. Just doing the simple things like staying well hydrated and applying sunscreen helped keep troops comfortable with all their gear on. “There was lots of monotony in the training, falling again and again, as repetition helped seed in people’s minds what to be aware of to prevent many injuries,” said Cryer.

In the case of most of the class, this was the group’s first experience with the operational side of the military. The large volume of enlisted troops impressed Kone, in particular. “I think the experience gave me a better awareness of what soldiers go through,”

Kone said. “Even though half the time we were sitting around waiting to jump, while we were waiting we had to sit with all the equipment on in the heat.” Kone feels this experience gave her a better understanding of the unique burdens that the enlisted soldiers have to bear. The three students insist that preventive medicine will only go so far, as they still have to be prepared to respond to anything that can happen to the soldiers on the battlefield. “When you’re treating someone and they see the patch, they see that you know at least a little bit of what they go through and you have a connection with the patient,” said Kuehn. — Akiko Lattin •



Facing Deployment Challenges

Shortly after the September 11 attack on American soil last year, U.S. forces entered Afghanistan in search of suspected Al Qaeda terrorists. Those found, along with sympathetic Taliban members, were sent to the naval station at Guantanamo Bay, Cuba, where they remain as political detainees.

The U.S. government set up concertina wire-encased tent cities, dubbed “Camp X-Ray,” for the detainees, just as they did for Haitian refugees previously encamped on the island. Teams of uniformed police officers, health care workers and others were deployed in support of the mission.

Lt. Cmdr. Christine Beadle (MPH ’86), a clinical epidemiologist at the Naval Medical Center, San Diego, was sent to the base commonly called “GITMO” for a stint that was expected to last up to six months. She was among the team of physicians, nurses and technicians tasked with providing medical care to detainees as part of Joint Task Force 160, a group of more than 1,500 uniformed service members representing all branches of the armed forces.

Although she had no time to prepare, with only a few days’ notice, Beadle had a good idea of obstacles she would face in the modified field environment and tropical climate of GITMO, having conducted many pre-deployment briefs for various Navy ships and other groups as an experienced preventive medicine officer. She said her biggest concern was not that of interacting with men

considered by many to be among the world’s most dangerous terrorists but, rather, having sufficient resources to do the job effectively and having support from the task force leadership.

Beadle said she found that, upon their arrival, many of the detainees were malnourished, but they eventu-



Photos: US Navy

ally flourished under the care they received in the camp. “In fact, they wrote letters to family and friends describing their treatment and told how they were gaining weight and getting better medical care than most had ever had in their lives,” she said. However, malnourished people are often more susceptible to a variety of infections and, Beadle said, despite the majority of them being young and healthy, the health care workers saw evidence of infection in the detainees.

She said the potential existed for illnesses to be carried by and spread among the detainees, as well as transmitted to U.S. forces or members of the local community.

Her role was to develop and institute preventive medicine procedures to keep them healthy and avoid the spread of infectious diseases, something Beadle was able to accomplish during her time at Camp X-Ray.

In fact, while she was there, several cases of chicken pox arose, but with

good management, they were contained. Beadle also said there were a few instances of malaria in people who refused to finish their malaria chemoprophylaxis but, thanks to good vector control, it did not get transmitted. Likewise, she said, there was an excellent tuberculosis control program so health care providers were rapidly able to identify converters as well as those with active cases, preventing the spread of tuberculosis.

Beadle noted that dengue fever was discovered only 15 miles from the camp, but they were alert to the possibility of its transmission and that of dengue hemorrhagic fever, so emphasis was placed on emptying standing

containers of water, getting lids on garbage cans, and other possible areas where mosquitoes might gather.

While some task force members reportedly encountered difficulties when dealing with the detainees, including receiving head butts, bites and death threats, Beadle said she had no trouble. “For the most part, I was treated with respect and dignity since the detainees realized I was there to help them.” Not so, however, for one of her co-workers. “I had a roommate who was an orthopedic surgeon who was not treated so well, as she occasionally had to operate on someone who was either not enthusiastic about getting surgery or not enthusiastic about a female surgeon,” Beadle said.

Religious differences had only a slight impact on medical care as well. “There were some refusals to taking prophylactic medications because of their

belief that their health was in God’s hands,” Beadle said. “Part of those refusals, however, may have been due to fear or lack of trust in us since the detainees did not know what was in the pills we tried to give them.” For that reason, Beadle said, she tried to work with translators to teach them why the medical teams wanted to give the detainees certain medications, but resources were insufficient to get that endeavor off the ground.

Ironically, the biggest deployment challenges Beadle said she faced came not from the detainees but from the health care teams themselves.

“Unfortunately, teams don’t always recognize other groups as part of their team, and there is a tendency not to share information among team members which causes much frustration,” she said. In addition, the lack of transportation posed a significant problem

to the preventive medicine personnel. “On deployments, Medical seems to get the fewest vehicles, but in the case of preventive medicine personnel (preventive medicine officers and technicians, environmental health officers), this is mission-defeating as water samples, food inspections, data collection, spraying for insects, etc., need to be done by the preventive medicine people and can’t be done without vehicles,” she said. “In this, history repeats itself over and over again.”

Despite the challenges Beadle faced during her three-month deployment at Camp X-Ray, she appreciated the experience and believes her past military assignments prepared her for the mission.

“It was the culmination of everything I have been learning throughout my whole career.” — Sharon Willis •



Pennsylvania Miners Aided by Trauma Surgeon

When Dr. Russell Dumire and his family settled into the idyllic countryside of southeastern Pennsylvania, they had no idea that their new home would be the scene of two national incidents within the same year, with Dumire himself playing a role in both.

On Sept. 11, 2001, shortly after leaving the Air Force and beginning his new job at the Conemaugh Memorial Medical Center in Johnstown, Pa., the critical care/trauma surgeon, and USU class of 1987 graduate, went about his daily routine in the hospital. But shortly before 9 a.m., his routine was interrupted by the news of terrorist attacks on the World Trade Center in New York, followed by an attack on the Pentagon in Washington, D.C.

As the nation watched in horror, terrorists hijacked United Flight 93, intent on flying the fully-fueled jet into the White House or Capitol. However, through the heroic efforts of passengers on board, the plan was thwarted, but the plane crashed in a field in Shanksville, Pa., less than 30 miles from Johnstown. Dumire, along with the rest of the medical center staff, stood by, awaiting the arrival of any crash victims. It soon became apparent there were no survivors.

Eleven months later, the eyes of the country were once again focused on the region as nine coal miners became trapped in water 240 feet underground in the Quecreek Mine near Sipesville, again, less than 30 miles from Johnstown. Twenty-four-hour

coverage blanketed the news, chronicling the entire event. This time Dumire was not watching the news; he was making it. As the on-call trauma surgeon, one of three in the medical center, he was summoned to the scene to oversee the miners' medical care.

According to Dumire, no one knew exactly what kind of injuries the nine coal miners would present, but moderate to severe hypothermia was highly probable. He said he was also worried about traumatic crush injuries caused by the pressure of rushing water, as well as decompression sickness facing the workers after the ascent from the mine shaft during their rescue.

A medical center in nearby Altoona, Pa., was equipped with a five-hour recompression chamber but, Dumire said, because of the potential for traumatic injuries requiring immediate medical attention, it could not be used. Instead, he credits the efforts of Pennsylvania Governor Mark Schweiker and Rep. John Murtha, in whose district the accident occurred, with bringing a Navy team to the scene, equipped with individual rapid recompression chambers. Pumps were put in place to relieve the water pressure, and warm air was pumped into the shaft throughout the ordeal to try and stem the hypothermia.

"Getting the pipe down with the warm air was probably life saving for them," said Dumire. "And the fact that these nine individuals decided very early on

that they were either going to live or die as a group. When one would get cold, the other eight would huddle around and warm that one person. When another person got cold, the favor was returned. When the hot air pipe came down, they huddled around that pipe for warmth and they kept changing their positions, back to back, side to side, to keep all parts of their bodies warm."

Dumire, whose last assignment before leaving the Air Force was as a trauma surgeon and instructor with the former Joint Trauma Training Center at Ben Taub Medical Center in Houston, Texas, said the overall conditions of cold-water immersion and hypothermia facing the miners were not unusual, especially for that area of the state. "The conditions were common to trauma across the board," Dumire said. "What was uncommon was to have nine people all in the same situation."

On their fifth day underground, the miners were rescued. Dumire cared for six of the men at Memorial Medical Center, while the other three were treated at a nearby hospital. One of the men in his care needed to use the Navy's recompression chamber before going for further treatment.

"When they arrived here they were all in surprisingly very good condition," Dumire said. "The care that they received during the entrapment, extrication and transportation made our job very easy here."

— Sharon Willis •

Photos: Navy Medicine



'80

Col. Howard Heiman retired in August from the Army. Heiman's last assignment was as chairman of neonatology at Wilford Hall USAF Medical Center in San Antonio, Texas. He is now living in Long Island, N.Y., where he is working in the neonatal-perinatal division at North Shore University Hospital in Manhasset.

'81

Col. Ken Franklin, MC, USA, retired at Fort Benning, Ga., after 25 years of service on June 30. His final assignment was as chief of the Winder Family Clinic and as faculty for the Martin Army Community Hospital family medicine residency. Franklin started his new job as a partner in Family Doctors of Vicksburg, Mich., in August. His wife, Terri, is now serving as director of marketing and community relations with the Kalamazoo Red Cross. Franklin remains active in the Uniformed Services Academy of Family Physicians and plans to speak on the rewards of a career in Army medicine at Michigan high schools and colleges.

Col. Don Bradshaw, MC, USA, is currently the director, Clinical Operations Division of the TRICARE Lead Agent, Fort Carson, Colo. Bradshaw will assume command of Martin Army Community Hospital at Fort Benning, Ga., in 2003.

'82

Col. Alton Powell, USAF, MC, and classmate Col. Lawrence Riddles, USAF, MC, were both selected to command Air Force medical treatment facilities. Powell is commanding the 341st Medical Group, Malmstrom AFB, Mont. His previous assignment was at the hospital at Sheppard AFB, Texas.

Riddles, whose last assignment was as surgical operations squadron commander at the 81st Medical Group, Keesler AFB, Miss., recently assumed command of the 5th Medical Group, Minot AFB, N.D.

'83

Col. Jane Ward, USAF, MC, retired on Armed Forces Day, May 18, in a ceremony held at the Women In Service Memorial in Washington, D.C. Her last assignment was at the Air Force surgeon general's office at Bolling AFB, D.C., where she served as the program director for the Air Force International Health Specialist Program and special assistant for humanitarian and civic assistance. She and her husband, Col. Steve Waller, now live in Germany, where he serves as the U.S. Air Forces Europe chief of expeditionary medical operations at Ramstein air base. Waller's previous assignment was as director of the Surgeon's Tactical Action Team, in the office of the Air Force surgeon general.

'84

Col. Charles Beadling, USAF, MC, was selected to command the 375th Medical Group, Scott AFB, Ill. Beadling's last assignment was as commander of the 95 Medical Group, Edwards AFB, Calif.

Col. Terry Walters, MC, USA, recently finished the Army War College and was selected to command the 1st Medical Brigade at Fort Hood, Texas. She is also a graduate of USU's Master of Public Health program.

Capt. Sandra Kweder, USPHS, is the new deputy director of the Food and Drug Administration's Office of New Drugs. Her previous assignments included serving as deputy director of the Office of Drug Evaluation IV, co-chair of FDA's pregnancy labeling taskforce, acting director

of the Office of Review Management, and acting director of the Office of Drug Evaluation II. Kweder is also an associate professor of medicine at USU.

'85

Lt. Col. Loren Erickson, MC, USA, was selected to command the U.S. Army Center for Health Promotion and Preventive Medicine-Europe in 2003.

Col. Jeffrey Elting recently retired from the Army and was named medical director for bioterrorism coordination for the District of Columbia Hospital Association. Elting's role will be to help hospitals, public health offices and law enforcement agencies increase their emergency preparedness capabilities.

Prior to his retirement, Elting served as the senior medical officer for health policy and clinical services in the office of the Army surgeon general, and previously served as a White House physician under President Clinton. Elting is also a graduate of USU's Master of Public Health program.

Cmdr. Tom Snead, MC, USN, is now the officer-in-charge of the branch medical clinic at Naval Base, Ingleside, Texas.

'87

Col. Timothy Jex, USAF, MC, is serving as the U.S. Central Air Force Command Surgeon, based at Shaw AFB, S.C. Jex is responsible for the medical planning for the USCNTAF. He also manages medical war readiness materials for the USCNTAF, provides supervision, establishes policy, works logistics issues for all the deployed medical units, handles all medical issues for the CF Air Combat Command, and generally acts "as the scoutmaster for all

the deployed medical folks." Jex recently returned from a deployment to Afghanistan.

Lt. Col. David Hough retired from the Army in July. Hough is now an associate director of central nervous system research at Pfizer Global Research and Development in New London, Conn.

Lt. Col. Russell Dumire left the Air Force and is now a trauma surgeon with the Conemaugh Memorial Medical Center in Johnstown, Pa. He remains in the Air National Guard.

'88

Anderson Funke was promoted to Capt., U.S. Public Health Service, on Oct. 1. Funke is the medical director of the Carolina Health Centers in Greenwood, S.C.

'89

Army Lt. Col. William Magdycz recently transferred to McDonald Army Hospital in Fort Eustis, Va., where he is serving as a staff otolaryngologist.

'91

The Division of Commissioned Personnel of the U.S. Public Health Service recently announced their 2002 Exceptional Capability promotions. Forty-nine officers from throughout the entire USPHS were nominated. USU graduate Cmdr. Karen Parko was one of only 18 officers selected for the promotion, and one of only three physicians chosen for the honor. Parko's promotion to Captain was effective July 1. She is the director of neurological services for the Northern Navajo Medical Center in Shiprock, N.M.

'92

Lt. Cmdr. Noel Delmundo was promoted to commander, U.S. Public Health Service, on July 1.

Delmundo is assigned as staff in the obstetrics and gynecology department at the Phoenix Indian Medical Center in Ariz.

Maj. Damian Rispoli is now assigned as a staff orthopaedic surgeon at Malcolm Grow USAF Medical Center, Andrews AFB, Md.

‘93

U.S. Public Health Service alumni Kimberly (Clancy) Brownell, Jeffrey Curtis and Brent Warren were all selected for promotion to commander on July 1. Their classmates and fellow USPHS officers, Daniel Shine and Thomas Bonin, were both promoted early to the rank.

Brownell is a staff pediatrician at the Northern Navajo Medical Center in Shiprock, N.M., Curtis is a staff physician in the medicine/family practice department at the Phoenix Indian Medical Center, and Warren is an assistant professor and ophthalmologist in the USU Department of Surgery.

‘95

Maj. Todd Bertoch recently reported to David Grant USAF Medical Center, Travis AFB, Calif., where he is assigned to the anesthesia department.

Maj. Shean Phelps is now battalion surgeon for the 1st Special Forces Battalion, 1st

Special Forces Group, Panzer Kaserne, in Boeblingen, Germany.

‘96

Maj. Douglas Nelson is currently assigned in the medical oncology department at the 81st Medical Group, Keesler AFB, Miss.

‘98

Capt. Jocelyn Kilgore, USAF, MC, completed her psychiatry residency and is now assigned as a staff psychiatrist in Germany.

‘00

Lt. Erica Schwartz, a graduate of the Master of Public Health program in health services administration, is assigned as a staff

physician at the Navy Environmental Health Center in Portsmouth, Va.

‘01

Lt. Kenneth Terhaar is currently assigned as a general medical officer with the 3rd Medical Battalion, Bravo Company, in the 3rd Fleet Service Support Group, Okinawa, Japan. Previously, he completed his internship at the Naval Medical Center in San Diego, Calif.

Maj. Michael Sardelis, who earned his Doctor of Philosophy degree in zoology from USU, is in Nairobi, Kenya, at the U.S. Army Medical Research Unit-Kenya, where he is the chief of the entomology department. ●

The Gift of Life

If you ask class of ‘82 alumna, retired Army Col. Sue Abreu, to name the 10 best things she’s ever done, you’ll get some interesting answers. One of the first things that pops into her mind was helping a patient with oral cancer get dentures after the Army denied the request. The second is donating one of her kidneys to a fellow officer.

As odd as that sounds, that’s the perspective Abreu has on her recent kidney donation to retired Col. Ray J. Terrill.

“It’s not that big of a deal in most ways,” said Abreu, who retired in June after serving as the surgeon general’s consultant for nuclear medicine. “It was an opportunity for me to do something a little extra to help someone out. Actually, it was an honor for me to do it.”

“It’s hard to put into words how I feel about Sue,” said Terrill. “How do you say thank you to someone for giving you back your life? What words are strong enough to describe the gratitude I feel? They just don’t exist.”

Terrill, now working in Washington, D.C., had worked with Abreu for a number of years at Womack Army Medical Center.

While they were acquaintances, they were not close friends. That’s why her donation of a kidney means even more.

Terrill suffered from a degenerative kidney disease, which ultimately would have led him to dialysis and hopes of a kidney transplant. His illness had progressed to the point that doctors were recommending dialysis and he was on the wait list for a new kidney.

“Working with Ray, I knew he was sick and this thought came into my head that I could give him a kidney,” explained Abreu. “I honestly don’t know what started it, but it wouldn’t go away, so I started exploring the possibility.”

Abreu researched organ donation and approached Terrill’s physician, who then got in touch with the transplant team at the University of North Carolina at Chapel Hill, where Terrill was on the wait list. When the doctors agreed it was a possibility, Abreu had to tackle the biggest obstacle of all – Ray Terrill.

“When she came in my office to talk to me about it, I literally threw her out,” said Terrill, who was known at Womack for

his grumpy exterior. “At that point my mind wasn’t ready to go the distance. I couldn’t think to that point.”

Terrill said after the initial conversation a thousand thoughts ran through his head. “My major difficulty, the thing I couldn’t wrap my mind around, was the thought that if she did this it could jeopardize her health. I made her and her physicians tell me what her health was and her potential for maintaining a normal life. My most horrific thought was I’d get a kidney and then Sue would lose hers,” he said.

Terrill called Abreu’s offer a “shot in the dark” and “assumed it wouldn’t work.” Following a series of tests, doctors concluded that while the two were not a perfect match, they were close enough and agreed to proceed with the transplant.

“I will never be able to express my thanks and gratitude to her,” said Terrill. “I don’t think the words exist. But I know we’ll always be connected now. You can’t share this incredible gift and generosity without there being something there. I think about her a lot, and I’ll always wonder how she’s doing.” —Janice Burton, Womack Army Medical Center. ●

Class of 2002 Raises the Bar

One might not expect a university and medical school as young as USU to include established traditions, but its graduating classes have maintained the spirit of “giving something back” in keeping with the institution’s mission of service.

This year the class of 2002 of the School of Medicine decided, after extensive discussions and planning led by Ramey Wilson, Scott King and others, to undertake something ambitious in concert with the university’s vision of growth and enhanced public standing. In fact, students feel that their university is the “best kept secret in medical education.” They recognize that endowments in support of medical education and research are not only vital to the university’s mission, but also to perceptions held by the public, peers and future students.

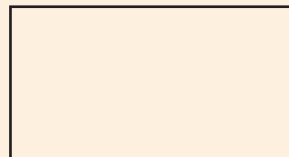
To that end, the class of 2002 has committed itself to establish the Endowment for the Advancement of Medical Education, whose purpose is to support activities not funded by appropriations or grants, including visiting lecturers, innovative or startup educational programs, and conferences. Members of the class hope to grow this endowment over a 10-year period, with the ambitious goal of \$5 million. To date, \$200,000 has been pledged by the class of 2002, primarily through payroll allotments. The class is hopeful that future graduating classes and alumni will join them in this effort.

Just as USU is exemplary in many ways, so is this undertaking initiated by the class of 2002. For more information on how you can participate, please contact Helaine Ahern, assistant vice president for development, at hahern@usuhs.mil.



*“We have incredibly talented, bright
and motivated residents, and being a
part of their development is an honor.”
— Lt. Col. Jim Ecklund*

***Uniformed Services University
4301 Jones Bridge Road
Bethesda, MD 20814-4799***



“Learning to care for those in harm’s way”

www.usuhs.mil